study when you have got beyond the necessity for them; until that time they are quite as likely to bewilder you as to be of any service. In the present state of knowledge regarding color, we can do better by trusting to the judgment of the eye, than by attempting to follow out any theory. If color looks well it is right. Of course, with practice and study you will improve—become more artistic and refined—in short, know more. In the mean time, there are certain facts well established by experience, some of which may be here set down for your guidance.

As a general rule, let the ornaments appear lighter than the background, unless this latter is of gold. A gold background may be left plain and dead, or burnished; it may be enriched by bright lines, filigree work or dots, by means of the burnisher; or it may be figured in the same style with lemon yellow. A dark green background may be enriched with the same kind of work in gold or in lighter green. A blue ground may have any enrichment painted on it in lighter blue. Let the light blue tend to a greenish rather than to a purplish hue. It may also be diapered with black lines, either in lozenges or in squares, laid horizontally or diagonally, with dots or flowers in the centres, either white or light blue. A purple or russet-red ground may be diapered with lines of crimson lake and dotted with scarlet.

Diapers are innumerable in their variety. They may be of one color, or of one color and gold, or of two colors and gold, as a groundwork for the ruled lines, but they must always be so designed as to form, size and color, as to allow the ornament in front of them to appear distinctly, not being lost or muddled in the work behind it. A few forms are here given to serve as examples of what may be done.

The diaper, Fig. 3, may be made with alternate light blue (cobalt and white) and white lozenges, and the lines ruled broadly with gold; or it may be of a little darker blue alternated with gold, and ruled with black. B is made with gold and dark blue lozenges, the gold with rings and dots made bright with the point of the burnisher, and the blue with a white flower or cross, the whole ruled with black.

Fig. 5 may be entirely blue ground ruled with black and dotted with white, gold, or very light blue; or purple ground ruled with crimson lake and dotted with pink or scarlet.

Fig. 4 is intended for a gold ground ruled and dotted with the burnisher, but may be of varied colors like the others.

Fig. 6 represents a peculiar class of diapers, which require a certain amount of space to show them to advantage. In the present example the squares which are left white represent gold, the light horizontally lined squares a rather dark tint of French blue and white, and the dark perpendicularly lined squares a russet red made with India red and carmine. The dots in the corners are a greenish turquoise blue on the blue, pure orange vermilion on the red and on the gold dots impressed with the burnisher until they sparkle. This diaper, when fairly shown, has a kind of changeable quality—iridescence it might be called—which gives great value to the more boldly-colored ornament which may come in front of it. When you use a diaper of this kind there must be open space enough to show it, so that the eye may readily perceive the whole pattern, and that the varying colors may have their due effect.

Figs. 1 and 2 are primarily intended for gold grounds figured with bright lines, although they may be executed in gold lines on any colored ground, and also in a lighter tint of the same color as the ground. The end to be sought in diapering or damascening of this kind is, that the ground shall be so closely and uniformly covered, that individual forms in it, although graceful in themselves, shall not be prominent, and that the whole shall form a rich background of fluctuating color and light, to set forth the more important objects. Delicate but lively contrasts of this kind stand high among the charms of illumination, and to the cultivated taste give pleasure corresponding to that produced by atmospheric effects in a picture.

C. M. JENCKES.

[To be continued.]

AMONG the useful instruments which most designers seem to ignore is the compass with three points. It serves to transfer at once the three angles of a triangle, or three points in the circumference of a circle, from which the centre may at once be found by a well-known method. By the proportional compass all the trouble of enlarging or reducing a given design is avoided.

Amateur Photography.

TALKS WITH BEGINNERS.

IX.—PRINTING ON PLAIN PAPER.

THERE are many to whom the gloss of an albumen print is distasteful, and who find bromide paper somewhat too expensive for general use. For such, a return to the old method of printing on plain paper is recommended. There is a softness and richness to these prints which make the process well worth a trial. It is free from many of the ills that albumen paper is heir to, and personally, I confess, to a preference for prints on plain paper for general work. The paper can be procured ready salted from any dealer in photographic goods; that prepared by Morgan or Clemons is good. Salted paper needs only to be sensitized and fumed to be ready for printing. The paper is sensitized by floating for one minute on a forty-grain bath of nitrate of silver; it is then dried and fumed twenty or thirty minutes.

It will be found that thin negatives are not well suited to the process, since it has a tendency to lessen contrasts. For this reason only plucky negatives of good density should be selected when plain paper is used. Very dense negatives may be printed from in full sunlight, but as a rule it is better to print under ground glass or in diffused light. The printing must be carried very far if dark tones are desired. Print until the detail is almost obscured and the shadows well bronzed.

When the printing is done the prints are thoroughly washed to remove the last traces of silver. They are then ready for the toning bath. Almost any good bath will give satisfactory results with plain paper, if care be taken to make it up much weaker than when albumen prints are to be toned. The plain paper tones very quickly, and over-toning must be carefully avoided. A good bath is made by dissolving ten grains of bicarbonate of soda in sixteen ounces of water, and adding one grain of gold. The bath should be made up an hour or two before it is to be used, but it must be used the same day it is made. The prints are toned and fixed like albumen prints, but the after washing need not be so thorough.

This is the simplest method of making prints on plain paper, and if the capabilities of the process ended here, it would hardly be worth while to call attention to it. But if one is willing to take the trouble to salt his paper, he can produce beautiful prints on almost any paper of good texture, and in this way produce a great variety of charming and unusual effects. The only conditions to be observed are that the paper be not too bibulous, and that it be tough enough to stand the much soaking to which it is of necessity subjected. Drawing, crayon, Japanese, writing and other papers, and even thin cardboard, can be salted, sensitized and printed.

The salting is done by floating the paper upon or immersing it in, either of the following baths for three minutes:

1. Gelatine	100 grains
Chloride of ammonium	100 "
Chrome alum	5 "
Water	20 ounces.
2. Gelatine	100 grains
Sodium chloride	100 "
Sodium carbonate	200 "
Water	20 ounces.

No. 1 gives purple black tones and No. 2 sepia and dead black, according to the depth of printing and the duration of toning. Citrate of sodium may be substituted for the carbonate if desired.

If the paper is floated it should be marked on the wrong side and well dampened to avoid curling up. If it is immersed, care must be taken to break all adhering air bells.

When dry the paper is sensitized on a forty-grain bath.

What is known as the ammonia-nitrate of silver bath seems to give the best results with plain paper. This is made by dissolving nitrate of silver in water in the proportion of fifty grains to the ounce. One third of the solution is set aside, and to the remainder strong ammonia is added until the precipitate that formed is redissolved. The remaining one third is then added and well mixed, bitric acid is then added, drop by drop, until the brown precipitate of oxide of silver is nearly all redissolved. The bath should now test alkaline with litmus paper, and is ready for use. Paper floated on this bath requires no fuming, and if printed deeply will give black tones without any toning. Better results are obtained by toning in a mixed bath made by two ounces of hyposulphite of sodium in one pint of water, adding two grains of chloride of gold dissolved in one ounce of water, and twenty grains of silver also dissolved in one ounce of water. The prints are left in this bath until they assume the desired tone, having been previously well washed. After a thorough washing they are ready for mounting.

Rough surface paper will be improved by a three-minutes immersion in a ten-grain solution of gelatine, with the addition of a few grains of chrome alum. This fills the pores and keeps the image from sinking into the paper.

Bertrand's and Cooper's formulæ for plain paper are also well worth trying. Bertrand recommends that the paper be immersed for three minutes on the following bath:

Alcohol	20 ounces
Benzoin	2 "
Chloride of cadmium	1 ounce.

Cooper's formulæ is as follows:

Frankincense	200 grains
Gum mastic	160 "
Chloride of calcium	150 "
Alcohol	20 ounces.

The last two formulæ render detail with greater richness and delicacy than the more usual method given above.

A good toning bath for prints on paper so prepared is made by dissolving one grain of chloride of platinum in sixteen ounces of water, and neutralizing the solution with carbonate of potassium. Just before using, one half a dram of formic acid is added, and the bath used at once. This bath gives strong black tones.

W. H. BURBANK.

EXPERIMENTS WITH PLAIN PAPER.

MR. EDWARD REAMING'S experience in the use of plain paper is given as follows, in his own words: "The paper that I have found most suitable for general work is known as plain Saxe paper, Rives No. 74. It is first salted by floating on, or immersing in a solution of chloride of ammonium in water, the strength of the solution being from 8 to 12 grs. to the ounce, or a mixture of the chloride of sodium and ammonium may be used; it is then hung up to dry, and can be silvered as soon as dried, or be kept for any length of time before silvering. The silvering can be performed on the ordinary bath, or a special strength of bath may be used for special negatives, or a silver bath of the ammonia nitrate of silver may be used. The paper is then hung up to dry as before, and in the case of the ordinary silver bath the paper can be 'fumed' before printing. In this stage the paper will keep good for three or four days, if excluded from light, the ammonia nitrate paper spoiling soonest. After printing it is toned in the ordinary manner, or with special toning baths, or may be fixed without toning, each process having its individual peculiarity of result. If unsized papers are used, it will be found best to size them before salting, or they can be salted and sized in the same bath. Gelatine is frequently used for this purpose, also Iceland moss and various resins. While I have tried several different salting and sizing solutions, and also various toning baths, I have made special experiments in the use of different papers, such as varieties of Japanese parchment papers, Japanese tissue paper, Whatman's drawing paper, the paper that is used for bromide prints, and even the common cardboard mounts themselves, each paper giving a different result, so that you have at your command an almost infinite variety of tones and effects. To begin with the plain Saxe or Rives papers: The paper was salted in a bath containing 12 ozs. of the chloride of ammonium to the ounce of water; then silvered in a bath containing 40 grs. of nitrate of silver to the ounce of water, and toned in a bath composed of the carbonate of soda, 50 grs., phosphate soda, 62 grs, chloride of sodium, 30 grs., water, 32 ozs., with gold from 10 to 15 grs., the result, as you see, being from a purple tone to a warm black. Other specimens were salted and silvered in the same manner as the first, but were toned with platinum. I tried at first some of the published platinum-toning formulæ, but although I obtained some good results, they were so irregular that I tried to devise a formula of my own, and found one that to me seems perfectly satisfactory. It is composed of platinic chloride, 1 gr., and 16 ozs. water, neutralized with potassium carbonate, and one half to one dram formic acid added. If the toning is carried far enough a fine platinum black is the result, warmer than the platinotype; if not carried so far, a sepia results which is admirable for some subjects. In all these manipulations with plain paper, overtoning is to be avoided, as a flat print is always the result. The toning with platinum has this to recommend it, it is the cheapest form of silver printing with toning that I know of—cheaper than gold. I have successfully toned two 18x22 sheets of paper with one grain of platinum, although usually I allow one grain to each sheet. I noticed that the plain silver bath gives warmer tones, the ammonia nitrate giving a bluish black. One of the prints from the ammonia nitrate bath I toned with acetate of lead with the result of a warmer tone." Mr. Leaming is confident that the plain paper prints are reasonably permanent, and he says he knows of a number of instances of prints made from twenty to thirty years ago which show no signs of fading.